

CLAIMS

What is claimed is:

1. A process for ink-jet printing an image onto a rigid thermoplastic interlayer comprising the step: feeding a rigid interlayer sheet through an ink jet printer and ink-jet printing an image on the sheet, wherein the interlayer has a Storage Young's Modulus of 50-1,000 MPa (mega Pascals) at 0.3 Hz and 25°C, as determined according to ASTM D 5026-95a, and wherein the rigid interlayer sheet has a finite thickness of less than or equal to about 0.38 mm.
2. The process of Claim 1 wherein the interlayer is either an ethylene/(meth)acrylic acid copolymer ionomer or PVB comprising plasticizer in an amount of less than 30 parts per hundred parts based on the weight of the interlayer sheet.
3. The process of Claim 2 wherein the interlayer is an ethylene/(meth)acrylic acid copolymer ionomer.
4. The process of Claim 3 further comprising the step of laminating the image-bearing interlayer sheet with a second interlayer sheet which is non-image bearing, to form a composite image-bearing interlayer, wherein the total thickness of the composite interlayer is in the range of from about 0.40 mm to about 2.29.
5. The process of Claim 4 wherein the image-bearing surface of the rigid interlayer is the surface that is in contact with the surface of the second interlayer sheet.
6. The process of Claim 5 wherein the second interlayer sheet is an ethylene/(meth)acrylic acid copolymer ionomer.
7. The process of Claim 6 wherein the second interlayer sheet has a thickness of from about 0.76 mm to about 1.13 mm.
8. A process for obtaining a decorative laminate comprising the steps:
(1) "ink jet" printing pigmented ink onto at least one surface of an interlayer sheet which is a rigid ethylene/methacrylic acid copolymer ionomer having a thickness of less than or equal to about 0.38 mm and wherein the interlayer has a Storage Young's Modulus of 50-1,000 MPa (mega Pascals) at 0.3 Hz and 25°C, as determined according to ASTM D 5026-95a, to obtain an image-

bearing interlayer sheet; and (2) laminating the image-bearing interlayer sheet between sheets of transparent materials to obtain a decorative laminate.

9. The process of Claim 8 wherein the rigid interlayer comprises a roughened surface having a roughness (R_z) of from about 5 μm to about 15 μm prior to lamination.
10. The process of Claim 9 wherein the rigid image-bearing interlayer is laminated with one or more other interlayer sheets to yield a composite interlayer having a total thickness of from about 0.40 mm to about 2.29 mm.
11. The process of Claim 10 wherein the other interlayer comprises a thermoplastic polymer selected from polymers in the group consisting of: PVB; PET; PUR; PC; PVC; of ethylene/(meth)acrylic acid copolymer ionomers; ethylene/(meth)acrylic acid/alkyl acrylates terpolymers.
12. The process of Claim 11 wherein the image is printed using a drop on demand (DOD) ink jet printing process.
13. The process of Claim 12 wherein the DOD process is a piezo electric process.
14. The process of Claim 12 wherein the DOD process is a thermal ink jet printing process.
15. The process of Claim 11 wherein the image is printed using a continuous drop ink jet printing process.
16. A decorative laminate obtained by the process of Claim 8.
17. The laminate of Claim 16 wherein the image-bearing interlayer is laminated with at least one additional sheet of at least one other interlayer to produce a composite image-bearing interlayer, wherein the at least one additional interlayer sheet has a thickness sufficient to such that the total thickness of the composite interlayer falls within a range of from about 0.40 mm to about 2.29 mm, and wherein the composite image-bearing interlayer is further laminated with at least one sheet of glass.

18. The laminate of Claim 17 wherein the total thickness of the composite interlayer is in the range of from about 0.6 mm to about 1.75 mm.
- 5 19. The laminate of Claim 18 wherein the total thickness of the composite interlayer is in the range of from about 1.14 mm to about 1.52 mm.
- 10 20. A thermoplastic interlayer sheet bearing an image on at least one surface of the interlayer sheet, the image being printed on the sheet by a process comprising the step: feeding a rigid interlayer sheet through an ink jet printer and ink-jet printing an image on the sheet, wherein the interlayer has a Storage Young's Modulus of 50-1,000 MPa (mega Pascals) at 0.3 Hz and 25°C, as determined according to ASTM D 5026-95a, and wherein the rigid interlayer sheet has a finite thickness of less than or equal to about 0.38 mm.
- 15 21. The interlayer of Claim 20 wherein the interlayer has a surface roughness of from about 5 μm to about 15 μm .
22. The interlayer of Claim 21 wherein the size of the image does not change by more than $\pm 1\%$ of the initial size of the image after drying at 60°C for 30 minutes after the image is printed.

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